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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,815	04/26/2005	Yuichi Kubo	740107-185	8898
25570	7590	03/19/2008	EXAMINER	
ROBERTS, MLOTKOWSKI & HOBBS P. O. BOX 10064 MCLEAN, VA 22102-8064				MCCLELLAND, KIMBERLY KEIL
ART UNIT		PAPER NUMBER		
1791				
NOTIFICATION DATE		DELIVERY MODE		
03/19/2008		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/532,815	KUBO ET AL.	
	Examiner	Art Unit	
	KIMBERLY K. MCCLELLAND	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 21 December 2007.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/26/05</u> . | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-20 in the reply filed on 12/21/07 is acknowledged.

Claim Objections

2. Claim 6 is objected to because of the following informalities: The first period in line 6 appears to be a typo. Claims may only contain one sentence. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,766,638 to Moore ('638) in view of U.S. Patent No. 4,688,540 to Ono.

5. With respect to claim 1, Moore ('638) discloses a method of spreading wafer, including a conveying step of conveying said plate-like article (1) to a different area in said dicing device; an expanding step of expanding said adhesive sheet (2) with said plate-like article being mounted to said frame (5); and an expansion maintaining step of maintaining an expanded state of said adhesive sheet with said plate-like article being

mounted to said frame after said expanding step, wherein at least said expansion maintaining step is performed in said different area (column 3, lines 20-49; See Figures 1-5). Moore ('638) also discloses said plate-like article is able to be conveyed together with said frame with the increased spacings between said chips being maintained (column 3, lines 60-62). Examiner notes the phrase "said plate-like article is able to be conveyed together with said frame with the increased spacings between said chips being maintained" is not an actual method step, and only requires an ability of the resulting stretched article. However, Moore ('638) does not disclose conveying said plate-like article together with said chuck stage of said dicing device to a different area in said dicing device without being detached from said chuck stage after the dicing of said plate-like article

6. Ono discloses a dicing method, including conveying said plate-like article together with said chuck stage of said dicing device to a different area in said dicing device without being detached from said chuck stage after the dicing of said plate-like article (See Figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the step of conveying the attached wafer taught by Ono with the conveying step of Moore ('638). The motivation would have been to allow the wafer and chips to be transported with greater efficiency and minimal disturbance.

7. As to claim 2, Moore ('638) discloses the expanding step includes a step of heating and stretching said adhesive sheet (column 3, lines 23-25 and lines 45-47).

8. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,766,638 to Moore ('638) in view of U.S. Patent No. 4,688,540 to Ono as applied to claims 1-2 above, and further in view of U.S. Patent No. 5,186,775 to Cullen et al.

9. With respect to claim 3, Moore ('638) discloses a method of spreading wafer, including the expanding step includes a step of forming a protrusion (i.e. inverted cup shape) in a portion of said adhesive sheet between said frame and said plate-like article (column 3, lines 41-45). However, Moore ('638 does not disclose the expansion maintaining step includes a step of welding or bonding a base of said protrusion of said adhesive sheet.

10. Cullen et al. discloses a container fabrication method, including expansion maintaining step includes a step of welding or bonding a base of said protrusion of said adhesive sheet (column 3, lines 15-22; See Figures 8-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the welding step taught by Cullen et al. with the expansion maintaining step disclosed by Moore ('638). The motivation would have been to secure the edges of the adhesive film improving stabilization of the expanded sheet through immobilization.

11. As to claim 4, Moore ('638) does not specifically disclose the base of said protrusion formed in said adhesive sheet is ultrasonically welded.

12. Cullen et al. discloses a container fabrication method, including base of said protrusion formed in said adhesive sheet is ultrasonically welded (column 3, lines 15-22;

See Figures 8-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the welding step taught by Cullen et al. with the expansion maintaining step disclosed by Moore ('638). The motivation would have been to secure the edges of the adhesive film improving stabilization of the expanded sheet through immobilization.

13. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,766,638 to Moore ('638) in view of U.S. Patent No. 4,688,540 to Ono as applied to claims 1-2 above, and further in view of U.S. Patent No. 4,209,958 to Bailey.

14. With respect to claim 5, Moore ('638) discloses a method of spreading wafer, including expanding step is performed with said plate-like article being placed on said chuck stage of said dicing device, and includes a step of temporarily maintaining the expanded state of said adhesive sheet on said chuck stage using a clamping member (column 2, lines 36-40). However, Moore ('638) does not specifically disclose the expansion maintaining step includes a step of forming a loose part outside said clamping member of said adhesive sheet to nip and secure a base of said loose part of said adhesive sheet.

15. Bailey discloses an article strapping method, including forming a loose part (64/66) outside said clamping member (48/52/55) of said sheet to nip and secure a base of said loose part of said sheet (See Figures 6-9). The combination of the prior art elements of clamping to form excess film used along with bonding the excess film would have yielded the predictable result of reducing the bulk of the excess film material. The

claimed subject matter merely combines familiar elements (clamping and bonding excess film) according to known methods and does no more than yield predictable results. If a technique has been used to improve one device (e.g. packaging device), and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way (film stretching), using the technique is obvious unless its actual application is beyond his or her skill.

16. As to claim 6, Moore ('638) discloses the expanding step is performed in a dicing area of said dicing device after the dicing of said plate-like article, and said plate-like article with the expanded state of said adhesive sheet being temporarily maintained is conveyed to a different area in said dicing device together with said chuck stage, and said expansion maintaining step is performed in said different area (column 3, lines 20-50).

17. As to claim 7, Moore ('638) discloses expanding step and said expansion maintaining step are performed in said different area in said dicing device (column 3, lines 60-65).

18. As to claim 8, Moore ('638) does not disclose the expansion maintaining step includes a step of securing said base of said loose part of said adhesive sheet by welding or bonding.

19. Bailey discloses an article strapping method, including the expansion maintaining step includes a step of securing said base of said loose part (64/66) of said sheet by welding or bonding (See Figures 6-9). The combination of the prior art elements of clamping to form excess film used along with bonding the excess film would have

yielded the predictable result of reducing the bulk of the excess film material. The claimed subject matter merely combines familiar elements (clamping and bonding excess film) according to known methods and does no more than yield predictable results. If a technique has been used to improve one device (e.g. packaging device), and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way (film stretching), using the technique is obvious unless its actual application is beyond his or her skill.

20. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,766,638 to Moore ('638) in view of U.S. Patent No. 4,688,540 to Ono as applied to claims 1-2 above, and further in view of U.S. Patent No. 6,176,966 to Tsujimoto et al.

21. With respect to claim 9, Moore ('638) discloses a method of spreading wafer, including expanding step includes a step of heating and stretching said adhesive sheet (column 3, lines 23-25 and lines 45-47). However, Moore ('638) does not disclose a heat-shrinkable sheet is used as said adhesive sheet, and said expanding step and said expansion maintaining step are simultaneously performed by heating said adhesive sheet in at least a pair of areas sandwiching said plate-like article in parallel with a dicing line of said plate-like article in the portion of said adhesive sheet between said plate-like article and said frame.

22. Tsujimoto et al. discloses a die bonding method, including a heat-shrinkable sheet is used as said adhesive sheet, and said expanding step and said expansion

maintaining step are simultaneously performed by heating said adhesive sheet in at least a pair of areas (3; See Figure 1) sandwiching said plate-like article in parallel with a dicing line of said plate-like article in the portion of said adhesive sheet between said plate-like article and said frame (column 2, lines 26-33). It is known in the art that stretching/tensioning a web may be performed by decreasing the amount of material over a given length, increasing the length of the web, or a combination of each to yield the predictable result of an expanded web. The substitution of one tensioning method (the heat-shrink film taught by Tsujimoto et al.) for another (the upward force expansion disclosed in '638) would achieve the predictable result of forming spaces between individual chips.

23. As to claim 10, Moore ('638) does not disclose adhesive sheet is heated in at least a pair of areas sandwiching said plate-like article in parallel with a dicing line in one direction of said plate-like article, and in at least a pair of areas sandwiching said plate-like article in parallel with a dicing line perpendicular to the dicing line in said one direction, and heating temperatures of said areas are individually controlled according to the state of increase in the spacings between said individual chips.

24. Tsujimoto et al. discloses a die bonding method, including the adhesive sheet is heated in at least a pair of areas (3; See Figure 1) sandwiching said plate-like article in parallel with a dicing line in one direction of said plate-like article, and in at least a pair of areas sandwiching said plate-like article in parallel with a dicing line perpendicular to the dicing line in said one direction, and heating temperatures of said areas are individually controlled according to the state of increase in the spacings between said

individual chips (column 2, lines 26-33; column 6, lines 23-25). It is known in the art that stretching/tensioning a web may be performed by decreasing the amount of material over a given length, increasing the length of the web, or a combination of each to yield the predictable result of an expanded web. The substitution of one tensioning method (the heat-shrink film taught by Tsujimoto et al.) for another (the upward force expansion disclosed in '638) would achieve the predictable result of forming spaces between individual chips.

25. As to claim 11, Moore ('638) discloses the adhesive sheet is heated (column 3, lines 32-45). However, Moore ('638) does not disclose after the dicing of said plate-like article, said adhesive sheet is heated without said plate-like article being detached from said chuck stage of said dicing device.

26. Ono discloses a dicing method, including after the dicing of said plate-like article, said adhesive sheet is transported without said plate-like article being detached from said chuck stage of said dicing device (See Figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the step of conveying the attached wafer taught by Ono with the conveying step of Moore ('638). The motivation would have been to allow the wafer and chips to be transported with greater efficiency and minimal disturbance.

27. Claims 12-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,766,638 to Moore ('638) in view of U.S. Patent No. 4,688,540 to Ono

as applied to claims 1-2 above, and further in view of U.S. Patent No. 3,790,051 to Moore ('051) and U.S. Patent No. 6,176,966 to Tsujimoto et al.

28. With respect to claim 12, Moore ('638) discloses a method of spreading wafer, including said expanding step includes a step of applying tension to said adhesive sheet (See Figure 5). However, Moore ('638) does not disclose a heat-shrinkable sheet is used as said adhesive sheet, and said expansion maintaining step includes a step of forming a loose part in a portion of said adhesive sheet between said plate-like article and said frame, and heating and shrinking said loose part to eliminate said loose part.

29. Moore ('051) discloses a wafer fracturing technique, including the expansion maintaining step includes a step of forming a loose part in a portion of said adhesive sheet between said plate-like article and said frame (201; See Figure 8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a loose part as taught by Moore ('051) in the adhesive sheet of Moore ('638). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the vacuum maintaining step taught by Moore ('051) with the expansion maintaining step of Moore ('638). The motivation would have been to tightly form the adhesive sheet onto the surrounding frame, even after the tensioning force is eliminated.

30. Tsujimoto et al. discloses a die bonding method, including a heat-shrinkable sheet is used as said adhesive sheet (3; See Figure 1) and heating and the excess film to eliminate the excess film (column 2, lines 26-33). It is known in the art that stretching/tensioning a web may be performed by decreasing the amount of material

over a given length, increasing the length of the web, or a combination of both to yield the predictable result of an expanded web. The substitution of one tensioning method (the heat-shrink film taught by Tsujimoto et al.) for another (the upward force expansion disclosed in '638) would achieve the predictable result of forming spaces between individual chips.

31. As to claim 13, Moore ('638) does not disclose the loose part is formed after the expanded state of said adhesive sheet in the portion on which said expanded plate-like article is stuck is maintained by suction or mechanically, and said maintenance by suction or mechanical maintenance is released after said loose part is heated and shrunk.

32. Moore ('051) discloses a wafer fracturing technique, including the loose part is formed after the expanded state of said adhesive sheet in the portion on which said expanded plate-like article is stuck is maintained by suction or mechanically, and said maintenance by suction or mechanical maintenance is released (201; See Figure 8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a loose part as taught by Moore ('051) in the adhesive sheet of Moore ('638). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the vacuum maintaining step taught by Moore ('051) with the expansion maintaining step of Moore ('638). The motivation would have been to tightly form the adhesive sheet onto the surrounding frame, even after the tensioning force is eliminated.

33. Tsujimoto et al. discloses a die bonding method, including a heat-shrinkable sheet is used as said adhesive sheet (3; See Figure 1) and heating and the excess film to eliminate the excess film (column 2, lines 26-33). It is known in the art that stretching/tensioning a web may be performed by decreasing the amount of material over a given length, increasing the length of the web, or a combination of both to yield the predictable result of an expanded web. The substitution of one tensioning method (the heat-shrink film taught by Tsujimoto et al.) for another (the upward force expansion disclosed in '638) would achieve the predictable result of forming spaces between individual chips.

34. As to claim 14, Moore ('638) discloses plate-like article and said frame are relatively separated to expand said adhesive sheet (See Figure 5). However, Moore ('638) does not disclose the relative separation between said plate-like article and said frame is terminated to form said loose part.

35. Moore ('051) discloses a wafer fracturing technique, including the loose part is formed when relative separation between said plate-like article and said frame is terminated (201; See Figure 8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a loose part as taught by Moore ('051) in the adhesive sheet of Moore ('638). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the vacuum maintaining step taught by Moore ('051) with the expansion maintaining step of Moore ('638). The motivation would have been to tightly form the adhesive sheet onto the surrounding frame, even after the tensioning force is eliminated.

36. As to claim 15, Moore ('638) discloses said adhesive sheet is pressed between said plate-like article and said frame to expand said adhesive sheet (See Figure 5). However, Moore ('638) does not disclose the press of said adhesive sheet between said plate-like article and said frame is released to form said loose part.

37. Moore ('051) discloses a wafer fracturing technique, including the press of said adhesive sheet between said plate-like article and said frame is released to form said loose part (201; See Figure 8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a loose part as taught by Moore ('051) in the adhesive sheet of Moore ('638). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the vacuum maintaining step taught by Moore ('051) with the expansion maintaining step of Moore ('638). The motivation would have been to tightly form the adhesive sheet onto the surrounding frame, even after the tensioning force is eliminated.

38. As to claim 16, Moore ('638) does not disclose portion of said adhesive sheet outside said plate-like article is heated in a ring shape to shrink said loose part.

39. Tsujimoto et al. discloses a die bonding method, including a portion of said adhesive sheet outside said plate-like article is heated in a ring shape to shrink said loose part (3; See Figure 1). It is known in the art that stretching/tensioning a web may be performed by decreasing the amount of material over a given length, increasing the length of the web, or a combination of both to yield the predictable result of an expanded web. The substitution of one tensioning method (the heat-shrink film taught

by Tsujimoto et al.) for another (the upward force expansion disclosed in '638) would achieve the predictable result of forming spaces between individual chips.

40. As to claim 17, Moore ('638) discloses the adhesive sheet is expanded (column 3, lines 32-45; See Figure 5). However, Moore ('638) does not disclose after the dicing of said plate-like article, said adhesive sheet is expanded without said plate-like article being detached from said chuck stage of said dicing device.

41. Ono discloses a dicing method, including after the dicing of said plate-like article, said adhesive sheet is transported without said plate-like article being detached from said chuck stage of said dicing device (See Figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the step of conveying the attached wafer taught by Ono with the conveying step of Moore ('638). The motivation would have been to allow the wafer and chips to be transported with greater efficiency and minimal disturbance.

42. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,766,638 to Moore ('638) in view of U.S. Patent No. 4,688,540 to Ono as applied to claims 1-2 above, and further in view of U.S. Patent No. 6,383,606 to Broyles and U.S. Patent No. 6,176,966 to Tsujimoto et al.

43. With respect to claim 18, Moore ('638) discloses a method of spreading wafer, including expanding step includes a step of relatively vertically separating said plate-like article and said frame (See Figure 5 and expansion maintaining step includes a step of sticking a different ring-shaped frame to said expanded adhesive sheet (column 4, lines

2-10). However, Moore ('638) does not specifically disclose applying a lateral force to said adhesive sheet, or cutting said adhesive sheet near an outer periphery of said different frame.

44. Broyles discloses a method of expanding wafers, including applying a lateral force to said adhesive sheet (See Figures 6-7). It is known in the art that stretching/tensioning a web may be performed by decreasing the amount of material over a given length, increasing the length of the web, or a combination of both to yield the predictable result of an expanded web. The substitution of one tensioning method (the lateral force expansion taught by Broyles) for another (the upward force expansion disclosed in '638) would achieve the predictable result of forming spaces between individual chips.

45. Tsujimoto et al. discloses a die bonding method, including cutting said adhesive sheet near an outer periphery of said different frame (3; See Figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the excess sheet material cutting step taught by Tsujimoto et al. with the method of Moore ('638). The motivation would have been to reduce the bulk of the resulting article, allowing more efficient transport and storage.

46. As to claim 19, Moore ('638) does not disclose the lateral force applied to said adhesive sheet is applied by inflating an airbag.

47. Broyles discloses a method of expanding wafers, including the lateral force applied to said adhesive sheet is applied by inflating an airbag (See Figures 6-7). It is known in the art that stretching/tensioning a web may be performed by decreasing the

amount of material over a given length, increasing the length of the web, or a combination of both to yield the predictable result of an expanded web. The substitution of one tensioning method (the lateral force expansion taught by Broyles) for another (the upward force expansion disclosed in '638) would achieve the predictable result of forming spaces between individual chips.

48. As to claim 20, Moore ('638) discloses it is known in the art to use ring of the same size as clamping members (5/11; See Figure 2). It is inherent the different ring (column 4, lines 2-10) would be of the same type and dimensions as the first ring (5/11), in order to tightly fit around the button (18).

Conclusion

49. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 5,809,624 to Nakamae et al. discloses a similar film stretching method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KIMBERLY K. MCCLELLAND whose telephone number is (571)272-2372. The examiner can normally be reached on 8:00 a.m.-5 p.m. Mon-Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip C. Tucker can be reached on (571)272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KKM

/Philip C Tucker/
Supervisory Patent Examiner, Art Unit 1791